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Use of ELVIS II platform for random process modelling and analysis of its probability density function

Maslennikova Y., Nugmanov I.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© Published under licence by IOP Publishing Ltd.The problem of probability density function estimation for a random process is one of the most common in practice. There are several methods to solve this problem. Presented laboratory work uses methods of the mathematical statistics to detect patterns in the realization of random process. On the basis of ergodic theory, we construct algorithm for estimating univariate probability density distribution function for a random process. Correlational analysis of realizations is applied to estimate the necessary size of the sample and the time of observation. Hypothesis testing for two probability distributions (normal and Cauchy) is used on the experimental data, using χ2 criterion. To facilitate understanding and clarity of the problem solved, we use ELVIS II platform and LabVIEW software package that allows us to make the necessary calculations, display results of the experiment and, most importantly, to control the experiment. At the same time students are introduced to a LabVIEW software package and its capabilities.

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